

ABSTRACT OF THE DISCLOSURE

A digital watermark embedding apparatus comprises an acquisition unit configured to acquire a topological invariant as digital watermark information, key  
5 information corresponding to the digital watermark information, and a target content in which the digital watermark information is to be embedded, function generation unit configured to generate a topological function corresponding to the topological invariant,  
10 a randomizing-function generation unit configured to generate a randomizing function based on the key information, and compute a composite function by composition of the randomizing function and the topological function, and a function-embedding unit  
15 configured to embed the composite function in the target content.